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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,647	09/28/2001	Alfred J-Tsung Pan	10010865-1	1928

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EXAMINER

WILLS, MONIQUE M

ART UNIT PAPER NUMBER

1746

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/964,647		PAN ET AL.	
	Examiner		Art Unit	
	Monique M Wills		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed March 10, 2004. The following rejections are maintained:

- Claims 1-2 rejected under 35 U.S.C. 102(e) as being anticipated by Heller U.S. Patent 6,294,281.
- Claims 4-6 & 16-17 rejected under 35 U.S.C. 102(e) as being anticipated by Berlowitz U.S. Pub. 2001/10038934.
- Claims 7-12 & 18-21 rejected under 35 U.S.C. 102(e) as being anticipated by Wagaman U.S. Patent 6,331,220.
- Claims 4-6 & 16 rejected under 35 U.S.C. 102(e) as being anticipated by Wagaman U.S. Patent 6,331,220.
- Claim 3 rejected under 35 U.S.C. 103(a) as being unpatentable over Heller U.S. Patent 6,294,281.

Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. A brief reiteration of the rejections is recited below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Heller U.S.

Patent 6,294,281.

Heller teaches a biological fuel cell comprising biological fluid such as blood, sap and other biological fluids or solids as the fuel for a bio-cell (col. 3, lines 1-7). With respect to claim 1, the fuel cell is a liquid-type fuel cell charged with blood or hemoglobin fuels (col. 3, lines 10-20) and a platinum anode (col. 4, lines 25-35). The limitation in claim 1, with respect to the fuel additive reducing CO poisoning to the platinum-based catalyst, is considered to be an inherent property of the hemoglobin additive in the fuel as set forth in the prior art, because Heller employs the same hemoglobin fuel set forth by Applicant. The limitation in claim 1, with respect to the fuel additive being pre-packaged for field use, is considered to be an inherent property of the fuel as set forth in the prior art, because Heller employs a fuel where hemoglobin is part of the fuel composition. According to Applicant's specification on page 4, lines 1-9, a pre-packaged fuel is a fuel that contains the additive before use. The fuel of Heller inherently contains the additive before use because hemoglobin is part of the naturally occurring fuel composition.

With respect to claim 2, the fuel comprises hemoglobin (col. 3, lines 15-20).

Therefore, the instant claims are anticipated by the prior art set forth.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 4-6 & 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Berlowitz U.S. Pub. 2001/10038934.

Berlowitz teaches a fuel cell system using emulsified fuel wherein water is added to the fuel to decrease the amount of CO to the catalyst (par. 8-9). With respect to claim 4, Berlowitz teaches providing a liquid-type fuel cell using a fuel and water emulsion (par. 1); where the fuel cell is being supplied liquid fuel through a pump/delivery system (par. 12). The limitation in with respect to the fuel cell having an electrode, is considered to be an inherent property of the fuel cell as set forth in the prior art, because fuel cells must contain electrodes in order to generate electricity. As to the fuel cell having liquid-catalyst interface, is considered to be an inherent property of the fuel cell as set forth in the prior art, because the fuel cell is a phosphoric acid fuel cell (par. 8). Phosphoric acid fuel cells have liquid phosphoric acid electrolytes interposed between catalyzed electrodes, thereby providing a liquid-catalyst interface. The limitation with respect to the fuel additive increasing wettability of the electrode and decreasing interfacial tension of the liquid-catalyst interface, is considered to be an inherent function of the fuel additive as set forth by the prior art, because Berlowitz and Applicant employ the same non-ionic surfactant fuel additive.

In re claims 5 & 6, the fuel contains a surfactant (par. 7) in an amount less than 0.5*% of the total emulsion weight (par. 17).

The limitation in claim 16, with respect to the fuel additive being pre-packaged for field use, is considered to be an inherent property of the fuel as set forth in the prior art, because Berlowitz employs a fuel, where the surfactant is part of the fuel composition. According to Applicant's specification on page 4, lines 1-9, a pre-packaged fuel is a fuel that contains the additive before use. The fuel of Berlowitz, inherently contains the additive before use, because the surfactant is part of the fuel composition.

With respect to claim 17, the surfactant may be non-ionic (par. 18).
Therefore, the instant claims are anticipated by the prior art as set forth.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7-12 & 18-21 are rejected under 35 U.S.C. 102(e) as being anticipated by
Wagaman U.S. Patent 6,331,220.

Wagaman teaches a gas-generating liquid composition for use in fuel cells (co. 3, lines 50-55). With respect to claim 7, a fuel cell capable of utilizing the gas-generating liquid composition is provided (col. 3, lines 45-50) and ammonium thisulfate is added to the fuel to

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reduce dissolved oxygen in the fuel (col. 7, lines 22-26). With respect to claim 10, a fuel cell capable of utilizing the gas-generating liquid composition is provided (col. 3, lines 24-50) and a chelating agent may be added to the fuel to bind impure⁴ metal ions in the fuel (col. 7, lines 25-35). The limitations of claim 10, with respect to the fuel cell having a catalyst and an electrolyte, is considered to be an inherent property of the fuel cell as set forth in the prior art, because all fuel cells by definition need electrolytes and catalyst in order to generate electricity. With respect to claims 8 & 11, the fuel may include minor additional components, such as a surfactant, oxygen scavenger and chelating agent (col. 7, lines 10-45). With respect to claims 9 & 12, these additive usually total less than 1 percent by weight of the composition (col. 7, lines 10-20). With respect to claim 19, the fuel may include a hydrazine sale, such as hydrazinium nitrate (col. 89, lines 60-65). With respect to claim 21, the chelating agent is ethylenediamine tetraacetic acid (EDTA), cyclohexanediaminetetraacetic acid (CDTA) or sodium salts of these compounds (col. 7, lines 25-35).

The limitation in claims 18, 20 & 21 with respect to the fuel additive being prepackaged for field use, is considered to be an inherent property of the fuel as set forth in the prior art, because Wagaman employs a fuel where the additives are part of the fuel composition. According to Applicant's specification on page 4, lines 1-9, a pre-packaged fuel is a fuel that contains the additive before use.

Therefore, the instant claims are anticipated by Wagaman.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 4-6 & 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Wagaman U.S. Patent 6,331,220.

With respect to claim 4, Wagaman teaches that fuel cells may use gas-generating liquid composition as fuel (col. 3, lines 45-51). The limitation in claim 4, with respect to the fuel cell having a liquid-catalyst interface, is considered to be an inherent property of the fuel cell as set forth in the prior art, because Wagaman teaches the use of liquid fuel as a reactant in a fuel cell (col. 3, lines 45-51). The limitation with respect to the fuel cell having an electrode, is considered to be an inherent property of the fuel cell as set forth in the prior art, because fuel cells must contain electrodes in order to generate electricity. The limitation with respect to the fuel additive increasing wettability of the electrode and decreasing interfacial tension of the liquid-catalyst interface, is considered to be an inherent function of the fuel additive as set forth by the prior art, because Wagaman and Applicant both employ surfactant fuel additives.

With respect to claims 5 & 6, the fuel includes a surfactant in an amount less than 1% by weight of the composition (col. 7, lines 10-45).

The limitation in claim 16, with respect to the fuel additive being prepackaged for field use, is considered to be an inherent property of the fuel as set forth in the prior art, because Wagaman employs a fuel where the surfactant is part of the fuel composition. According to

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Applicant's specification on page 4, lines 1-9, a pre-packaged fuel is a fuel that contains the additive before use. The fuel of Wagaman, inherently contains the additive before use, because the surfactant is part of the fuel composition. The prior art, Hard et al., U.S. Patent 5,501,915, is made of record and not relied upon, but is considered pertinent to Applicant's disclosure. Hard is evidence that fuel cells inherently have a liquid-catalyst interface (col. 2, lines 1-5).

Therefore, the claims are anticipated by the prior art set forth.

Claim Rejections ~ 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heller U.S. Patent 6,294,281.

Heller teaches a biological fuel cell comprising hemoglobin in the fuel, as described in the 35 U.S.C. § 102 (e) rejection cited hereinabove.

Heller is silent to hemoglobin being present in the range of 0.001-1% by weight of the fuel.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the hemoglobin in said amounts, since it has been held that discovering an optimum value of a result effect variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980). As taught by Heller in column 3,

lines 10-20, the skilled artisan recognizes that the amount of hemoglobin directly effects electroxidation in the operation of the fuel cell.

Allowable Subject Matter

Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The instant claims would be allowable over the prior art of record, because the prior art is silent to a method for improving performance of liquid-type fuel cells, wherein the fuel cell employees a fuel containing hemoglobin powder.

Response to Arguments

Applicant contends that Heller does not anticipate the instant claims, because the reference does not teach a fuel additive pre-packaged in the fuel cell, and that in Heller, the fuel is supplied into the fuel cell only after it has been implanted into a person or animal. The assertions are correct, but the argument is not persuasive. The claims require the fuel additive be pre-packaged in the fuel *not* the fuel cell. Heller employs a fuel where hemoglobin is part of the fuel composition. According to Applicant's specification on page 4, lines 1-9, a pre-packaged fuel is a fuel that contains the additive before use. Therefore, the fuel of Heller is pre-packed for field use, because hemoglobin is part of the naturally occurring fuel

composition. As a result, the rejection of claims 1-2 under 35 U.S.C. 102(e) as being anticipated by Heller U.S. Patent 6,294,281 is maintained.

Applicant contends that it would not have been obvious to modify the amount of hemoglobin to 0.0001-1 wt% in the fuel cell of Heller, because the reference fails to disclose the fuel cell could operate under these conditions. This argument is not persuasive. The amount of hemoglobin changes depending on the age, sex and health condition of the individual, and hemoglobin is present in non-diabetic blood under 5% (See Hemoglobin-Complete Blood Count). Therefore, it would be reasonable to expect that the fuel cell of Heller could operate when hemoglobin is present in an amount of 0.0001-1 wt%. Consequently, the rejection of claim 3 under 35 U.S.C. 103(a) as being unpatentable over Heller U.S. Patent 6,294,281 stands.

Applicant asserts that Berlowitz fails to disclose a fuel cell with a liquid-catalyst interface and an additive to decrease interfacial tension of the liquid-catalyst interface. This argument is not persuasive. Phosphoric acid fuel cells have liquid phosphoric acid electrolytes interposed between catalyzed electrodes, thereby providing a liquid-catalyst interface. As to the effect on interfacial tension, the fuel additive inherently decreases interfacial tension of the liquid-catalyst interface, because Berlowitz employs the instant non-ionic surfactant fuel additive. Therefore, the rejection of claims 4-6 & 16-17 under 35 U.S.C. 102(e) as being anticipated by Berlowitz U.S. Pub. 2001/10038934 stands.

Applicant asserts that Wagaman does not anticipate the instant claims, because the reference does not specifically disclose a liquid-type fuel cell having an electrode and a fuel, or the incorporation of the fuel additive to increase wettability of the electrode and decrease interfacial tension of the liquid-catalyst interface. This argument is not persuasive. Concerning the liquid-type fuel cell, Wagaman teaches a gas-generating *liquid* composition

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that may be used in fuel cells (col. 3, lines 50-51). Thereby, providing a liquid-type fuel cell, or fuel cell directly charged with liquid fuel. As to the incorporation of the additive to increase wettability and decrease interfacial tension, the additive of Wagaman performs said functions, because the reference employs the instant surfactant fuel additive. Therefore, the rejection of claims 4-12, 16 & 18-21 under 35 U.S.C. 102(e) as being anticipated by Wagaman U.S. Patent 6,331,220 stands.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

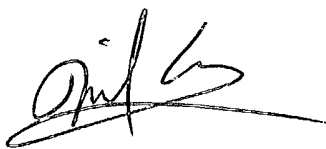
If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Michael Barr, may be reached at 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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MW

08/20/04



MICHAEL BARR
PRIMARY EXAMINER